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(54) **Efficacious vaccines against Bordetella pertussis comprising a combination of individually purified pertussis antigens.**

(57) This invention is directed to a vaccine for the prevention of disease caused by *Bordetella pertussis* which comprises the pertussis antigens filamentous hemagglutinin, detoxified lymphocytosis promoting factor and a 69 kilodalton outer membrane protein, where said antigens are individually purified prior to being combined to form the vaccine. The invention is further directed to pertussis vaccines where the antigens are combined in any ratio, including ratios not possible in whole cell or co-purified acellular pertussis vaccines. The pertussis antigens may be further combined with other individually purified pertussis antigens, pertussis structural components, adjuvants, stabilizers and non-pertussis vaccine components.

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DOCUMENTS CONSIDERED TO BE RELEVANT			
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (Int. Cl.5)
X	THE JOURNAL OF PEDIATRICS vol. 117, no. 1, July 1990, ST LOUIS, MISSOURI pages 46 - 51; D. A. BLUMBERG ET AL: 'Comparison of an acellular pertussis(DTP)vaccine with a whole-cell-pertussis-component DTP vaccine in 17-to24-month-old children, with measurement of 69KD outer membrane protein antibody' * the whole document, especially page 49 *	1-10	A61K39/10 A61K39/295 A61K39/102
X	AMERICAN JOURNAL OF DISEASES OF CHILDREN vol. 144, no. 8, August 1990, CHICAGO, US pages 899 - 904; E. A. MORTIMER ET AL: 'Protective efficacy of the TAKEDA acellular pertussis vaccine combined with diphtheria and tetanus toxoids following household exposure of Japanese children' * the whole document, especially pages 899-900 *	1-10	
E	EP-A-0 462 534 (SCLAVO S.P.A.) * the whole document, especially the abstract and examples 8-9 *	1-3,9-10	TECHNICAL FIELDS SEARCHED (Int. Cl.5)
A	VACCINE, vol. 8, October 1990, GUILDFORD GB pages 457 - 461; J. STORSAETER ET AL: 'Secondary analyses of the efficacy of two acellular pertussis vaccines evaluated in a Swedish phase III trial' * page 461 *	1-8	A61K C07K C12N C12P
P,X	WO-A-9 013 313 (THE WELLCOME FOUNDATION LIMITED) * the whole document, especially examples 4-5 *	1-8	
A	VACCINE, vol. 6, February 1988, GUILDFORD GB pages 29 - 32; D. A. RUTTER ET AL: 'Trial of a new acellular pertussis vaccine in healthy adult volunteers' * the whole document *	1	
The present search report has been drawn up for all claims			
Place of search THE HAGUE		Date of completion of the search 24 JUNE 1992	Examiner LE CORNEC N.D.R.
CATEGORY OF CITED DOCUMENTS			
X: particularly relevant if taken alone Y: particularly relevant if combined with another document of the same category A: technological background O: non-written disclosure P: intermediate document		T: theory or principle underlying the invention E: earlier patent document, but published on, or after the filing date D: document cited in the application L: document cited for other reasons A: member of the same patent family, corresponding document	



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DOCUMENTS CONSIDERED TO BE RELEVANT			
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (Int. Cl.5)
A	--- EP-A-0 235 474 (INSTITUT PASTEUR) " the whole document "	1	
A	--- EP-A-0 101 562 (AMERICAN CYANAMID COMPANY) " abstract "	1,9-10	
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The present search report has been drawn up for all claims			
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<div>CATEGORY OF CITED DOCUMENTS</div> <div><div>X : particularly relevant if taken alone Y : particularly relevant if combined with another document of the same category A : technological background O : non-written disclosure P : intermediate document</div><div>T : theory or principle underlying the invention E : earlier patent document, but published on, or after the filing date D : document cited in the application L : document cited for other reasons A : member of the same patent family, corresponding document</div></div>			